



Dart Aerospace Ltd.
1270 Aberdeen St
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K6A 1K7
Canada

Tel (613) 632-5200
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D119-796-241
Job Sheet 187569



Part No: D119-796-241

Job Qty: 1 pcs

Part Name: Aft Crosstube Installation Without Step (No Hardware)



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 12/7/18

Job Tracking No:

Due Date: 1/11/19

Created By: Jesse White

Type: Stock

Description:

Note: D119-796-241 REV.J IPP REV:A 14.09.03 NEW ISSUE DD VERF:JLM IPP REV:B 14.10.15 AS PER REV.B DD VERF:JLM IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV.D DD VERF:JLM IPP REV:E 15.02.11 AS PER REV.F JLM VERIFIED BY:DD IPP REV:F 17.05.08 AS PER IIN REV.F DD VERF:JFS

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
120	Packaging 1 - Pick Kit	1 pcs		1/11/19	0.00	0.00	Packaging 1 - 1		
							Packaging 1 - 2		
							Packaging 1 - 3		
							Packaging 1 - 4		
							Packaging 1 - 5		
							Packaging 1 - 6		
							Packaging 1 - 7		
							Packaging 1 - 8		
							Packaging 1 - 9		
							Packaging 1 - 10		
							Packaging 1 - 11		
							Packaging 1 - 12		
							Packaging 1 - 13		
							Packaging 1 - 14		
							Packaging 1 - 15		
							Packaging 1 - 16		
							Packaging 1 - 17		
							Packaging 1 - 18		
							Packaging 1 - 19		
							Packaging 1 - 20		
							Packaging 1 - 21		
							Packaging 1 - 22		
							Packaging 1 - 23		
							Packaging 1 - 24		GP 19-02-21
							Packaging 1 - 25		
							Packaging 1 - 26		
							Packaging 1 - 27		
							Packaging 1 - 28		
							Packaging 1 - 29		



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Container No: S155525



Part: D119-796-241

Job No: 187569

Serial No/Batch: S155525

Revision: J

Inspector:

Exp Date:

Instructions: TC STC SH14-45 - Issue 1, FAA/STC SR03504NY 15/01/28, EASA

				Packaging 1 - 30		
				Packaging 1 - 31		
				Packaging 1 - 32		
				Packaging 1 - 33		
				Packaging 1 - 34		
				Packaging 1 - 35		
				Packaging 1 - 36		
130	Crosstubes - Bend - 2 - B4B	1 pcs	1/11/19	4.67 4.17	Crosstubes - Bend - B4B	GP 19-02-21
140	QC 15	1 pcs	1/11/19	0.00 0.00	QC 15 - 12	
				QC 15 - 3		
				QC 15 - 38		
				QC 15 - 47		
				QC 15 - 49		
				QC 15 - 58		
				QC 15 - 9	FEB 22 2019	
145	Crosstubes - 2 - B4B	1 pcs	1/11/19	0.00 3.30	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B		
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
				Crosstubes - 5 - B4B		
				Crosstubes - 6 - B4B		
150	Crosstubes - 3 - B4B	1 pcs	1/11/19	0.00 3.30	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B		
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
				Crosstubes - 5 - B4B		
				Crosstubes - 6 - B4B		
160	Crosstubes - 4 - B4B	1 pcs	1/11/19	0.00 1.28	Crosstubes - 1 - B4B	
				Crosstubes - 2 - B4B		
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
				Crosstubes - 5 - B4B		
				Crosstubes - 6 - B4B		
170	QC 7	1 pcs	1/11/19	0.00 0.00	QC 7 - 10	
				QC 7 - 13		
				QC 7 - 14		
				QC 7 - 15		
				QC 7 - 17		
				QC 7 - 18		
				QC 7 - 19		
				QC 7 - 2		
				QC 7 - 28		
				QC 7 - 3		
				QC 7 - 30		
				QC 7 - 34		
				QC 7 - 36		
				QC 7 - 37		
				QC 7 - 38		
				QC 7 - 41		
				QC 7 - 47		
				QC 7 - 48		
				QC 7 - 51		
				QC 7 - 58		
				QC 7 - 59		
				QC 7 - 6		
				QC 7 - 60		
				QC 7 - 9		
				QC 7 - 68		

DAS
68
9-89

DAS
67 19-02-27
9-89

175 QC 5	1 pcs	1/11/19	0.00 0.00	QC 7 - 50	
				QC 7 - 67	
				QC 5 - 10	
				QC 5 - 12	
				QC 5 - 17	
				QC 5 - 18	
				QC 5 - 19	
				QC 5 - 22	
				QC 5 - 24	
				QC 5 - 3	
				QC 5 - 38	
				QC 5 - 42	
				QC 5 - 43	
				QC 5 - 49	
				QC 5 - 51	
				QC 5 - 58	
				QC 5 - 68	
				QC 5 - 9	
				QC 5 - 50	
				QC 5 - 30	
180 Outsource	1 pcs	1/11/19		SKY002-VC	DAS 13 9-89 2 MAR 1 1 2019
190 Packaging 2-1 - Receive - B4B	1 pcs	1/11/19	0.00 0.00	Packaging 2 - 1 - B4B	
				Packaging 2 - 2 - B4B	
				Packaging 2 - 3 - B4B	
				Packaging 2 - 5 - B4B	
				Packaging 2 - 4 - B4B	
				Packaging 2 - 6 - B4B	
				Packaging 2 - 7 - B4B	
				Packaging 2 - 8 - B4B	
				Packaging 2 - 9 - B4B	
				Packaging 2 - 10 - B4B	
				Packaging 2 - 11 - B4B	
				Packaging 2 - 12 - B4B	
				Packaging 2 - 13 - B4B	
				Packaging 2 - 14 - B4B	
				Packaging 2 - 15 - B4B	
				Packaging 2 - 16 - B4B	
				Packaging 2 - 17 - B4B	
				Packaging 2 - 18 - B4B	
				Packaging 2 - 19 - B4B	
				Packaging 2 - 20 - B4B	
200 QC 5	1	1/11/19	0.00 0.00	Packaging 2 - 21 - B4B	
				Packaging 2 - 22 - B4B	
				Packaging 2 - 23 - B4B	
				Packaging 2 - 24 - B4B	
				Packaging 2 - 25 - B4B	
				Packaging 2 - 26 - B4B	
				Packaging 2 - 27 - B4B	
				Packaging 2 - 28 - B4B	
				Packaging 2 - 29 - B4B	
				Packaging 2 - 30 - B4B	
				Packaging 2 - 31 - B4B	
				Packaging 2 - 32 - B4B	
				Packaging 2 - 33 - B4B	
				Packaging 2 - 34 - B4B	
				Packaging 2 - 35 - B4B	
				Packaging 2 - 36 - B4B	
				QC 5 - 10	

	pcs				QC 5 - 12	
					QC 5 - 17	
					QC 5 - 18	
					QC 5 - 19	
					QC 5 - 22	
					QC 5 - 24	
					QC 5 - 3	
					QC 5 - 38	
					QC 5 - 42	
					QC 5 - 43	
					QC 5 - 49	
					QC 5 - 51	
					QC 5 - 58	
					QC 5 - 68	
					QC 5 - 9	
					QC 5 - 50	
					QC 5 - 30	
230 Spray Paint - 2 - B4B	1 pcs	1/11/19	0.00 1.31	Spray Paint - 1 - B4B		RD 19-3-23
				Spray Paint - 2 - B4B		
				Spray Paint - 3 - B4B		
				Spray Paint - 4 - B4B		
240 QC 14	1 pcs	1/11/19	0.00 0.00	QC 14 - 15		AB 19-3-24
				QC 14 - 2		
				QC 14 - 34		
				QC 14 - 38		
				QC 14 - 41		
				QC 14 - 51		
				QC 14 - 58		
				QC 14 - 59		
				QC 14 - 9		
242 Crosstubes - 5 - B4B	1 pcs	1/11/19	0.00 3.30	Crosstubes - 1 - B4B		RD 19-3-25
				Crosstubes - 2 - B4B		
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
				Crosstubes - 5 - B4B		
				Crosstubes - 6 - B4B		
244 QC 5	1 pcs	1/11/19	0.00 0.00	QC 5 - 10		RD 19-03-23
				QC 5 - 12		
				QC 5 - 17		
				QC 5 - 18		
				QC 5 - 19		
				QC 5 - 22		
				QC 5 - 24		
				QC 5 - 3		
				QC 5 - 38		
				QC 5 - 42		
				QC 5 - 43		
				QC 5 - 49		
				QC 5 - 51		
				QC 5 - 58		
				QC 5 - 68		
				QC 5 - 9		
				QC 5 - 50		
246 Spray Paint - 3 - B4B	1 pcs	1/11/19	0.00 1.31	Spray Paint - 1 - B4B		RD 19-4-7
				Spray Paint - 2 - B4B		
				Spray Paint - 3 - B4B		
				Spray Paint - 4 - B4B		

248	Spray Paint - 4 - B4B	1 pcs	1/11/19	0.00 1.31	Spray Paint - 1 - B4B	RD 19-4-7
					Spray Paint - 2 - B4B	
					Spray Paint - 3 - B4B	
					Spray Paint - 4 - B4B	
250	QC 14	1 pcs	1/11/19	0.00 0.00	QC 14 - 15	AS 19-4-8
					QC 14 - 2	
					QC 14 - 34	
					QC 14 - 38	
					QC 14 - 41	
					QC 14 - 51	
					QC 14 - 58	
					QC 14 - 59	
					QC 14 - 9	
					QC 14 - 68	
252	Crosstubes - 6 - B4B	1 pcs	1/11/19	0.00 3.30	Crosstubes - 1 - B4B	RD 19-4-8
					Crosstubes - 2 - B4B	
					Crosstubes - 3 - B4B	
					Crosstubes - 4 - B4B	
					Crosstubes - 5 - B4B	
260	QC 5	1 pcs	1/11/19	0.00 0.00	Crosstubes - 6 - B4B	DAS APR 18 2019 68 9-89
					QC 5 - 10	
					QC 5 - 12	
					QC 5 - 17	
					QC 5 - 18	
					QC 5 - 19	
					QC 5 - 22	
					QC 5 - 24	
					QC 5 - 3	
					QC 5 - 38	
					QC 5 - 42	
					QC 5 - 43	
					QC 5 - 49	
					QC 5 - 51	
					QC 5 - 58	
					QC 5 - 68	
					QC 5 - 9	
					QC 5 - 50	
					QC 5 - 30	
270	Packaging 1-1 - Pick Kit - B4B	1 pcs	1/11/19	0.00 0.00	Packaging 1 - 1 - B4B	
					Packaging 1 - 2 - B4B	
					Packaging 1 - 3 - B4B	
					Packaging 1 - 4 - B4B	
					Packaging 1 - 5 - B4B	
					Packaging 1 - 6 - B4B	
					Packaging 1 - 7 - B4B	
					Packaging 1 - 8 - B4B	
					Packaging 1 - 9 - B4B	
					Packaging 1 - 10 - B4B	
					Packaging 1 - 11 - B4B	
					Packaging 1 - 12 - B4B	
					Packaging 1 - 13 - B4B	
					Packaging 1 - 14 - B4B	
					Packaging 1 - 15 - B4B	
					Packaging 1 - 16 - B4B	
					Packaging 1 - 17 - B4B	
					Packaging 1 - 18 - B4B	
					Packaging 1 - 19 - B4B	
					Packaging 1 - 20 - B4B	
					Packaging 1 - 21 - B4B	

					Packaging 1 - 22 - B4B	AB 19-4-8
					Packaging 1 - 23 - B4B	
					Packaging 1 - 24 - B4B	
					Packaging 1 - 25 - B4B	
					Packaging 1 - 26 - B4B	
					Packaging 1 - 27 - B4B	
					Packaging 1 - 28 - B4B	
					Packaging 1 - 29 - B4B	
					Packaging 1 - 30 - B4B	
					Packaging 1 - 31 - B4B	
					Packaging 1 - 32 - B4B	
					Packaging 1 - 33 - B4B	
					Packaging 1 - 34 - B4B	
					Packaging 1 - 35 - B4B	
					Packaging 1 - 36 - B4B	
280 QC 4	1 pcs	1/11/19	0.00	0.00	QC 4 - 26	
					QC 4 - 28	
					QC 4 - 38	
					QC 4 - 42	DAS
					QC 4 - 58	28
					QC 4 - 6	9-89
					QC 4 - 69	
					QC 4 - 9	
					QC 4 - 46	
290 Packaging 3-1 - Stock - B4B	1 pcs	1/11/19	0.00	0.00	Packaging 3 - 1 - B4B	
					Packaging 3 - 2 - B4B	
					Packaging 3 - 3 - B4B	
					Packaging 3 - 4 - B4B	
					Packaging 3 - 5 - B4B	
					Packaging 3 - 6 - B4B	
					Packaging 3 - 7 - B4B	
					Packaging 3 - 8 - B4B	
					Packaging 3 - 9 - B4B	
					Packaging 3 - 10 - B4B	
					Packaging 3 - 11 - B4B	
					Packaging 3 - 12 - B4B	
					Packaging 3 - 13 - B4B	
					Packaging 3 - 14 - B4B	
					Packaging 3 - 15 - B4B	
					Packaging 3 - 16 - B4B	
					Packaging 3 - 17 - B4B	
					Packaging 3 - 18 - B4B	
					Packaging 3 - 19 - B4B	
					Packaging 3 - 20 - B4B	
					Packaging 3 - 21 - B4B	
					Packaging 3 - 22 - B4B	AB 19-4-8
					Packaging 3 - 23 - B4B	
					Packaging 3 - 24 - B4B	
					Packaging 3 - 25 - B4B	
					Packaging 3 - 26 - B4B	
					Packaging 3 - 27 - B4B	
					Packaging 3 - 28 - B4B	
					Packaging 3 - 29 - B4B	
					Packaging 3 - 30 - B4B	
					Packaging 3 - 31 - B4B	
					Packaging 3 - 32 - B4B	
					Packaging 3 - 33 - B4B	
					Packaging 3 - 34 - B4B	
					Packaging 3 - 35 - B4B	

				Packaging 3 - 36 - B4B	
295 DC - 1 - B4B	1	1/11/19	0.00 0.00	DC - 1 - B4B	N.R. 27 APR 08 2019
	pcs			DC - 2 - B4B	
300 QC 21 - FG	1	1/11/19	0.00 0.00	QC 21 - FG - 21	
	pcs			QC 21 - FG - 70	

Part Op 120 - (Pick Kit)

Descriptions: 130 - (CNC Alpha 160 Bender) Bend tube as per Dwg D119-796-241 using CNC bender program

140 - (QC15- Crosstube Dimensional Check)

145 - (Crosstubes) 1- CUT TUBE AT HEIGHT ON FAI SHEET

150 - (Crosstubes) ***** ENSURE PROPER JIG POSITIONING *****

160 - (Crosstubes Chemical Conversion) ***IMMEDIATELY AFTER GRINDING***

170 - (QC7-Inspect Chemical Conversion Coat)

175 - (QC5- Inspect part completeness to step on W/O)

180 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

190 - (Receive & Inspect for Damage & Mat'l Certs) Ensure copy of NDT results attached to work order.

200 - (QC5- Inspect part completeness to step on W/O) *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

Inspect for damage & ensure results are as per Dwg D119-796-241

230 - (Spray Paint / NDT Room) ***VERIFY BY _____ BATCH # TO MATCH W/O 5143304

240 - (QC14- Inspect Spray Paint) ***VERIFY BY _____ BATCH # TO MATCH W/O _____

242 - (Crosstubes) Assemble as per dwg D119-796-241 and QSI 2- Install D5152-043 with proseal 890 on concave surface, 0.100" MIN thick as per dwg using DT10112 (identified right and left) 3- Install center support without boning. 4- Install Damper support and contact pads using proseal 890 per dwg and clamp in position. Proseal 5146134

244 - (QC5- Inspect part completeness to step on W/O) ***VERIFY BY _____ BATCH # TO MATCH W/O _____

246 - (Spray Paint / NDT Room) ***VERIFY BY _____ BATCH # TO MATCH W/O Primer 143304 clear

248 - (Spray Paint / NDT Room) ***VERIFY BY _____ BATCH # TO MATCH W/O 146036 138915

250 - (QC14- Inspect Spray Paint) ***VERIFY BY _____ BATCH # TO MATCH W/O _____

252 - (Crosstubes) 1- Re-install non fixed hardware per dwg ***Torque clamps on damper and contact pad to 80-100 IN-LBS.*** 2- Apply a file-seal of proseal 890 around damper supports and contact pads. Proseal 5146134 exp 10/19

260 - (QC5- Inspect part completeness to step on W/O) ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED AS PER DWG.*** 1- ATTACH A RED TAG TO CENTER SUPPORT THAT READS CENTER SUPPORT NOT FIXED THEN DATE AND STAMP IT.

270 - (Pick Kit)

280 - (QC4- 100% Inspect kits for completeness)

290 - (Identify as per dwg & Stock Location: _____) Identify and pack for shipping as per PPP D119-796-241

295 - (Document Control) Photocopy bluefile and create labels as per PPP D119-796-241 chg 005

300 - (QC21- Final Inspection - Work Order Release)

71 w/o 190029

19-10
Cure 72hrs
From 19-3-25
To
19-3-28

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D119-796-241TRN	Crosstube Turning Detail	1 Ea (1 ea)	120-Packaging 1 - Pick Kit	5737996
CR3212-4-07	Cherry Rivet	16 Ea (16 ea)	230-Spray Paint - 2 - B4B	
D2873-043	Nut Plate Assembly	4 Ea (4 ea)	230-Spray Paint - 2 - B4B	
D5122-1	Center Support, Upper	1 pcs (1 ea)	242-Crosstubes - 5 - B4B	
D5123-1	Clamp Cushion	6 pcs (6 ea)	242-Crosstubes - 5 - B4B	
D5123-5	Clamp Cushion	2 pcs (2 ea)	242-Crosstubes - 5 - B4B	
D5134-041	Damper Support Assembly, LH	1 pcs (1 ea)	242-Crosstubes - 5 - B4B	
D5134-042	Damper Support Assembly, RH	1 pcs (1 ea)	242-Crosstubes - 5 - B4B	
D5136-1	Contact Pad, LH	1 pcs (1 ea)	242-Crosstubes - 5 - B4B	
D5136-2	Contact Pad, RH	1 pcs (1 ea)	242-Crosstubes - 5 - B4B	
D5152-043	Aft Post Mount Assembly	2 pcs (2 ea)	242-Crosstubes - 5 - B4B	
MS21920-25	Clamp	6 Ea (6 ea)	242-Crosstubes - 5 - B4B	
MS21920-28	Clamp	2 Ea (2 ea)	252-Crosstubes - 6 - B4B	
D5515-1	Grounding Clamp	2 pcs (2 ea)	252-Crosstubes - 6 - B4B	
MS21042L3	Nut	2 Ea (2 ea)	252-Crosstubes - 6 - B4B	
MS27039-1-08	Screw	2 Ea (2 ea)	252-Crosstubes - 6 - B4B	
NAS1149D0332J	Washer	4 Ea (4 ea)	252-Crosstubes - 6 - B4B	
AN174-3A	Bolt	2 Ea (2 ea)	270-Packaging 1-1 - Pick Kit - B4B	
MS21042L4	Nut	2 Ea (2 ea)	270-Packaging 1-1 - Pick Kit - B4B	
NAS1149D0432J	Washer	4 Ea (4 ea)	270-Packaging 1-1 - Pick Kit - B4B	

Job Allocations				
Operation	Component Part	Required	Inventory	Allocated
120-Packaging 1 - Pick Kit	D119-796-241TRN	1	7	0
230-Spray Paint - 2 - B4B	CR3212-4-07	① 123435	215	0
	D2873-043	④ 145879	58	0
242-Crosstubes - 5 - B4B	D5122-1	① 110364	2	0
	D5123-1	⑥ 160081	138	0
	D5123-5	② 164415	176	0
	D5134-041	① 108290	6	0
	D5134-042	① 107553	4	0
	D5136-1	① 110574	4	0
	D5136-2	① 080136	10	0
	D5152-043	② 161662	2	0
252-Crosstubes - 6 - B4B	MS21920-25	⑥ 142190	163	0
	D5515-1 5114720	②	16	0
	MS21042L3 5157462	②	1,976	0
	MS21920-28 5123440	②	66	0
	MS27039-1-08 5132579	②	507	0
	NAS1149D0332J 5144850	④	2,738	0
270-Packaging 1-1 - Pick Kit - B4B	AN174-3A 5127325	②	22	0
	MS21042L4 5161468	②	1,579	0
	NAS1149D0432J 5096756	④	538	0

9-89

Part Specifications					
Spec No	Description	Target/Tolerance	Limits	Type	Special Comments
1	Crosstube Assembly (AW119 MKII Aft)	5.880Inches ± 0.030	5.910 5.850		
2	Crosstube Assembly (AW119 MKII Aft)	2.516Inches + 0.005 - 0.000	2.521 2.516		
3	Crosstube Assembly (AW119 MKII Aft)	2.626Inches + 0.005 - 0.000	2.631 2.626		
4	Crosstube Assembly (AW119 MKII Aft)	2.627Inches + 0.005 - 0.000	2.632 2.627		
5	Crosstube Assembly (AW119 MKII Aft)	2.798Inches + 0.005 - 0.000	2.803 2.798		
6	Crosstube Assembly (AW119 MKII Aft)	2.799Inches + 0.005 - 0.000	2.804 2.799		
7	Crosstube Assembly (AW119 MKII Aft)	2.989Inches + 0.005 - 0.000	2.994 2.989		
8	Crosstube Assembly (AW119 MKII Aft)	3.191Inches + 0.005 - 0.000	3.196 3.191		
9	Crosstube Assembly (AW119 MKII Aft)	3.200Inches + 0.005 - 0.000	3.205 3.200		
10	Crosstube Assembly (AW119 MKII Aft)	5.880Inches ± 0.030	5.910 5.850		
11	Crosstube Assembly (AW119 MKII Aft)	2.516Inches + 0.005 - 0.000	2.521 2.516		
12	Crosstube Assembly (AW119 MKII Aft)	2.626Inches + 0.005 - 0.000	2.631 2.626		
13	Crosstube Assembly (AW119 MKII Aft)	2.627Inches + 0.005 - 0.000	2.632 2.627		
14	Crosstube Assembly (AW119 MKII Aft)	2.798Inches + 0.005 - 0.000	2.803 2.798		
15	Crosstube Assembly (AW119 MKII Aft)	2.799Inches + 0.005 - 0.000	2.804 2.799		
16	Crosstube Assembly (AW119 MKII Aft)	2.989Inches + 0.005 - 0.000	2.994 2.989		
17	Crosstube Assembly (AW119 MKII Aft)	3.191Inches + 0.005 - 0.000	3.196 3.191		
18	Crosstube Assembly (AW119 MKII Aft)	3.200Inches + 0.005 - 0.000	3.205 3.200		
19	Crosstube Assembly (AW119 MKII Aft)	105.710Inches ± 0.020	105.730 105.690		



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D119-796-241
Job Sheet 187569



Part No: D119-796-241

Job Qty: 1 ea

Part Name: Aft Crosstube Installation Without Step (No Hardware)



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 12/7/18

Job Tracking No:

Due Date: 1/11/19

Created By: Jesse White

Type: Stock

Description:

Note: D119-796-241 REV.J IPP REV:A 14.09.03 NEW ISSUE DD VERF:JLM IPP REV:B 14.10.15 AS PER REV.B DD VERF:JLM IPP REV:C 14.11.19 AS PER REV.C DD VERF:JLM IPP REV:D 14.12.12 AS PER REV,pd1 DD VERF:JLM IPP REV:E 15.02.11 AS PER REV F JLM VERIFIED BY:DD IPP REV:F 17.05.08 AS PER IIN REV.F DD VERF:JFS

Ship Via:

Bill of Materials

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		1/11/19	0.00	0.00	Start Up Crosstubes-1		
120	Packaging	1 pcs		1/11/19	0.00	0.00	Packaging1-1		
130	CNC Bend Crosstubes	1 pcs		1/11/19	4.67	4.17	CNC Bend Crosstube		
140	QC	1 pcs		1/11/19	0.00	0.00	QC15		
145	Crosstubes	1 pcs		1/11/19	0.00	3.30	Crosstubes-1		
150	Crosstubes	1 pcs		1/11/19	0.00	3.30	Crosstubes-1		
160	HandFXtube	1 pcs		1/11/19	0.00	1.28	HandFinish5		
170	QC	1 pcs		1/11/19	0.00	0.00	QC7-1		
175	QC	1 pcs		1/11/19	0.00	0.00	QC5		
180	Outsource	1 pcs		1/11/19			SKY002-VC	2	
190	Packaging	1 pcs		1/11/19	0.00	0.00	Packaging2		
200	QC	1 pcs		1/11/19	0.00	0.00	QC5		
230	SprayPaint	1 pcs		1/11/19	0.00	1.31	Spray Paint		
240	QC	1 pcs		1/11/19	0.00	0.00	QC14		
242	Crosstubes	1 pcs		1/11/19	0.00	3.30	Crosstubes-1		
244	QC	1 pcs		1/11/19	0.00	0.00	QC5		
246	SprayPaint	1 pcs		1/11/19	0.00	1.31	Spray Paint		
248	SprayPaint	1 pcs		1/11/19	0.00	1.31	Spray Paint		
250	QC	1 pcs		1/11/19	0.00	0.00	QC14		
252	Crosstubes	1 pcs		1/11/19	0.00	3.30	Crosstubes-1		
260	QC	1 pcs		1/11/19	0.00	0.00	QC5		
270	Packaging	1 pcs		1/11/19	0.00	0.00	Packaging1-1		
280	QC	1 pcs		1/11/19	0.00	0.00	QC4		
290	Packaging	1 pcs		1/11/19	0.00	0.00	Packaging3-1		
295	DC	1 pcs		1/11/19	0.00	0.00	DC		
300	QC21-FG	1 Ea		1/11/19	0.00	0.00	QC21		

Part Op 130 - Bend tube as per Dwg D119-796-241 using CNC bender program

Descriptions: 145 - 1- CUT TUBE AT HEIGHT ON FAI SHEET

150 - ***** ENSURE PROPER JIG POSITIONING *****

160 - ***IMMEDIATELY AFTER GRINDING***

180 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

190 - Ensure copy of NDT results attached to work order.

200 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D119-796-241

230 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

240 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

242 - Assemble as per dwg D119-796-241 and QSI 2- Install D5152-043 with proseal 890 on concave surface, 0.100" MIN thick as per dwg using DT10112 (identified right and left) 3- Install center support without bonbing. 4- Install Damper support and contact pads using proseal 890 per dwg and clamp in position.

244 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

246 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

248 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

250 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____

252 - 1- Re-install non fixed hardware per dwg ***Torque clamps on damper and contact pad to 80-100 IN-LBS.*** 2- Apply a filet-seal of proseal 890 around damper supports and contact pads.

260 - ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED AS PER DWG*** 1- ATTACH A RED TAG TO CENTER SUPPORT THAT READS CENTER SUPPORT NOT FIXED THEN DATE AND STAMP IT.

290 - Identify and pack for shipping as per PPP D119-796-241

295 - Photocopy bluefile and create labels as per PPP D119-796-241 chg 005

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D119-796-241TRN	Crosstube Turning Detail	1 Ea (1 ea)	90-Start up Operation	
CR3212-4-07	Cherry Rivet	16 Ea (16 ea)	230-SprayPaint	
D2873-043	Nut Plate Assembly	4 Ea (4 ea)	230-SprayPaint	
D5122-1	Center Support, Upper	1 Ea (1 ea)	242-Crosstubes	
D5123-1	Clamp Cushion	6 Ea (6 ea)	242-Crosstubes	
D5123-5	Clamp Cushion	2 Ea (2 ea)	242-Crosstubes	
D5134-041	Damper Support Assembly, LH	1 Ea (1 ea)	242-Crosstubes	
D5134-042	Damper Support Assembly, RH	1 Ea (1 ea)	242-Crosstubes	
D5136-1	Contact Pad, LH	1 Ea (1 ea)	242-Crosstubes	
D5136-2	Contact Pad, RH	1 Ea (1 ea)	242-Crosstubes	
D5152-043	Aft Post Mount Assembly	2 Ea (2 ea)	242-Crosstubes	
MS21920-25	Clamp	6 Ea (6 ea)	242-Crosstubes	
MS21920-28	Clamp	2 Ea (2 ea)	252-Crosstubes	
D5515-1	Grounding Clamp	2 Ea (2 ea)	252-Crosstubes	
MS21042L3	Nut	2 Ea (2 ea)	252-Crosstubes	
MS27039-1-08	Screw	2 Ea (2 ea)	252-Crosstubes	
NAS1149D0332J	Washer	4 Ea (4 ea)	252-Crosstubes	
AN174-3A	Bolt	2 Ea (2 ea)	270-Packaging	
MS21042L4	Nut	2 Ea (2 ea)	270-Packaging	
NAS1149D0432J	Washer	4 Ea (4 ea)	270-Packaging	

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
90-Start up Operation	D119-796-241TRN	1	2	0
230-SprayPaint	CR3212-4-07	16	264 123435	0
	D2873-043	4	65	0
242-Crosstubes	D5122-1	4	6	0
	D5123-1	6	163	0
	D5123-5	2	184	0
	D5134-041	1	10	0
	D5134-042	1	8	0
	D5136-1	1	8	0
	D5136-2	4	14	0
	D5152-043	2	7	0
	MS21920-25	6	236	0
252-Crosstubes	D5515-1	2	24	0
	MS21042L3	2	3,230	0
	MS21920-28	2	92	0
	MS27039-1-08	2	564	0
	NAS1149D0332J	4	2,457	0
270-Packaging	AN174-3A	2	30	0
	MS21042L4	2	2,898	0
	NAS1149D0432J	4	829	0

8660

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition			Completed By
					Lead hand / Supervisor
					QC / QA Coordinator
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details: _____					

Part Specifications					
Spec No	Description	Target/Tolerance	Limits	Type	Special Comments
1	Crosstube Assembly (AW119 MKII Aft)	5.880Inches ± 0.030	5.910 5.850		
2	Crosstube Assembly (AW119 MKII Aft)	2.516Inches + 0.005 - 0.000	2.521 2.516		
3	Crosstube Assembly (AW119 MKII Aft)	2.626Inches + 0.005 - 0.000	2.631 2.626		
4	Crosstube Assembly (AW119 MKII Aft)	2.627Inches + 0.005 - 0.000	2.632 2.627		
5	Crosstube Assembly (AW119 MKII Aft)	2.798Inches + 0.005 - 0.000	2.803 2.798		
6	Crosstube Assembly (AW119 MKII Aft)	2.799Inches + 0.005 - 0.000	2.804 2.799		
7	Crosstube Assembly (AW119 MKII Aft)	2.989Inches + 0.005 - 0.000	2.994 2.989		
8	Crosstube Assembly (AW119 MKII Aft)	3.191Inches + 0.005 - 0.000	3.196 3.191		
9	Crosstube Assembly (AW119 MKII Aft)	3.200Inches + 0.005 - 0.000	3.205 3.200		
10	Crosstube Assembly (AW119 MKII Aft)	5.880Inches ± 0.030	5.910 5.850		
11	Crosstube Assembly (AW119 MKII Aft)	2.516Inches + 0.005 - 0.000	2.521 2.516		
12	Crosstube Assembly (AW119 MKII Aft)	2.626Inches + 0.005 - 0.000	2.631 2.626		
13	Crosstube Assembly (AW119 MKII Aft)	2.627Inches + 0.005 - 0.000	2.632 2.627		
14	Crosstube Assembly (AW119 MKII Aft)	2.798Inches + 0.005 - 0.000	2.803 2.798		
15	Crosstube Assembly (AW119 MKII Aft)	2.799Inches + 0.005 - 0.000	2.804 2.799		
16	Crosstube Assembly (AW119 MKII Aft)	2.989Inches + 0.005 - 0.000	2.994 2.989		
17	Crosstube Assembly (AW119 MKII Aft)	3.191Inches + 0.005 - 0.000	3.196 3.191		
18	Crosstube Assembly (AW119 MKII Aft)	3.200Inches + 0.005 - 0.000	3.205 3.200		
19	Crosstube Assembly (AW119 MKII Aft)	105.710Inches ± 0.020	105.730 105.690		

Plex 12/7/18 2:29 PM dart.white.jesse

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor		
			QC / QA Coordinator		
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details: _____					

D119-796-241 XTUBE ASSY (AW119 MKII AFT)

NOTES:

- 1) MATERIAL: N/A
- 2) FINISH: MASK D5134-041/-042 DAMPER SUPPORT ASSEMBLIES, CUFFS, D5136-1/-2 CONTACT PADS, THE COMPLETE CIRCUMFERENCE OF THE TUBE UNDER THE D5122-1 CENTER SUPPORT AND THE TAB ON THE D5515-1 GROUNDING CLAMP PRIOR TO APPLICATION OF CLEAR COAT/PAINT.
IF NECESSARY TOUCH UP PRIMER ON OUTSIDE OF CROSSTUBE PER DART QSI 005 4.2.
APPLY MATTE CLEAR COAT TO THE UNDERSIDE OF CROSSTUBE AS SHOWN (B4-2, HATCHED AREA) PER QSI 005 4.2.
MASK THE UNDERSIDE OF CROSSTUBE AS SHOWN (B4-2, HATCHED AREA).
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY USING PART NUMBER "D119-796-241" AND BATCH NUMBER
ON INSIDE OF CUFF PER QSI 044 6.4
- 7) WEIGHT: 26.26 lbs
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE.
THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM DEFECTS SUCH AS SCRATCHES, NICKS OR DENTS. DEFECTS UP TO 0.005 MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 9) INSTALL D5122-1 CENTER SUPPORT HAND TIGHT ONLY. DO NOT TORQUE. INSTALL RED TAG TO INDICATE "D5122-1 CENTER SUPPORT MUST BE BONDED PER IIN-D119-796 PRIOR TO FLIGHT".
- 10) PRIOR TO FINISHING, ABRASE MATING SURFACES OF D5136-1/-2 AND SURFACE OF CROSSTUBE WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH 'N' WIPE DEGREASER. APPLY A 0.100" MIN THK LAYER OF PROSEAL 890 ON THE INSIDE CONCAVE SURFACE OF THE D5136-1/-2 CONTACT PADS AND INSTALL AT AN 8.4" OFFSET FROM THE CROSSTUBE BENDING PLANE. INSTALL MS21920-25 CLAMPS AND D5123-5 CLAMP CUSHIONS WHILE WET. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.
- 11) TORQUE MS21920 CLAMPS 80 - 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY. THE NUT HAS NOT BOTTOMED-OUT AFTER TORQUING AND THE NUT IS FACING AFT.
- 12) PRIOR TO FINISHING, POSITION AND INSTALL D5134-041/-042 DAMPER SUPPORTS USING JIG DT10085. ABRASE MATING SURFACES OF THE D5134-041/-042 DAMPER SUPPORTS AND CROSSTUBE WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH 'N' WIPE DEGREASER. APPLY A 0.100" MIN THK LAYER OF PROSEAL 890 ON THE INSIDE CONCAVE SURFACE OF THE D5134-041/-042. INSTALL MS21920-25 CLAMPS AND D5123-1 CLAMP CUSHIONS WHILE WET. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS. ENSURE THAT THE MS21920 CLAMPS ARE POSITIONED AS SHOWN IN DETAIL C.
- 13) PRIOR TO FINISHING, ABRASE MATING SURFACES OF CROSSTUBE AND D5152-043 WITH SCOTCH BRITE 7447 RED AND REMOVE RESIDUE WITH DUPONT 4105S WASH 'N' WIPE DEGREASER. INSTALL D5152-043 WITH LAYER OF PROSEAL 890 ON INSIDE CONCAVE SURFACE, 0.100" MIN THK LOCATE D5152-043 USING TOOL DT10112.
- 14) INSTALL THE D5515-1 GROUNDING CLAMP AND ASSOCIATED HARDWARE PER DETAIL "C" PRIOR TO FINISHING. TORQUE THE MS21042-3 NUT 12-15 IN-LB. COMPLETELY SEAL THE EDGES OF THE CLAMP USING PROSEAL 890.
- 15) CARRY OUT A RESISTANCE CHECK BETWEEN THE D5515-1 GROUNDING CLAMP AND ANY UNPAINTED SECTION OF THE CROSSTUBE IN ACCORDANCE WITH AC43-13-1B CHAPTER 11. MAXIMUM RESISTANCE IS 3 MILLIOHMS.

RELEASED
2017-05-04
ECN 17-536

J	ADD NOTE 14 & 15 ON SHT 1. ADD PAINT/PRIMER MASKING LOCATIONS. REVISE NOTES ON SHT 1 & 4. REVISE BOM ON SHT 2 TO ADD GROUNDING CLAMP AND ASSOCIATED HARDWARE. REF PAR 17-580	ML	17.02.10
I	D6023-106 MATERIAL REPLACES D6009-106. D5136-1/-2 & D5134-041/-042 NOW INSTALLED ON PRIMER.	AP	15.10.13
H	NOTE 9 RE-WRITTEN. BONDING INSTRUCTIONS MOVED TO IIN. SEE PREVIOUS REV FOR DETAILS.	AP	15.07.02
G	FINISHING ORDER ADJUSTED. UPDATE BEND TOLERANCE AND TRN DETAIL. TOLERANCE TO MATCH D119-796-141 DWG	AP	15.04.24
F	REMOVED PRIMER/PAINT ON CUFFS. 2.516 WAS 2.500 (C8-5)	AP	15.02.03
E	D5152-043 WAS D5150-3. SCOTCH BRITE 7447 RED WAS 180 GRIT SANDPAPER	DB	15.01.15
D	ADD D5150-3 STEP POST (2X). MOVED INSPECTION WINDOW DETAIL TO SHT 1. MODIFIED NOTES ON SH 1 & 3	DB	14.11.25
C	CR3212-4-07 RIVETS WAS CR3212-4-05 RIVETS. RADIUS BLOCK WAS NUT PLATE ASSEMBLY (BOM). REMOVED 7.5 DEG CUFF HOLE OFFSET (A1-3). REDUCED CUFF DIA TO 2.500 (C8-5). ADD INSPECTION WINDOW	AP	14.10.23
B	ORIENTATION OF D5122-1 CENTER SUPPORT WAS CORRECTED. D5123-5 ADDED UNDER D5136-1/-2 CONTACT PADS. ADDED D2873-043 NUT PLATE ASSY & CR3212-4-05 RIVETS. ADDED REFERENCE TO SKIDTUBES FOR LOCATING CUFF HOLES. RE-ORGANIZED NOTES. REMOVED REDUNDANT INFORMATION.	AP	14.09.08
A	NEW ISSUE	AP	14.08.07
REV.	DESCRIPTION	BY	DATE
DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	ML		
CHECKED	JMH	DRAWING NO.	REV. J
MFG. APPR.	DP	D119-796-241	SHEET 1 OF 7
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII AFT)	NTS
DATE	17.02.10	COPYRIGHT © 2014 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

APPROVED

Entered: _____ Date: _____



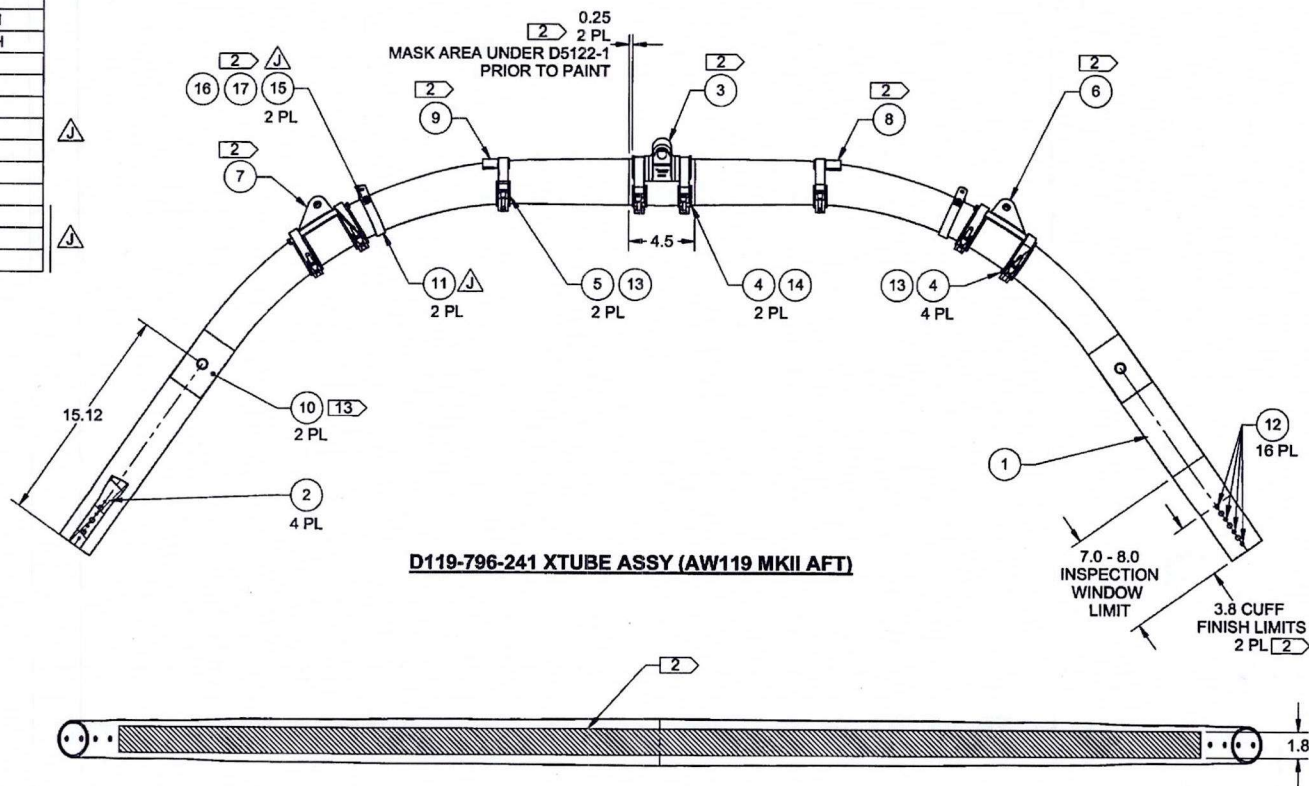
WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042) _____	
Description Work Order Deviation		Disposition		Completed By	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details: _____					

ITEM	QTY	P/N	DESCRIPTION
	X	D119-796-241	XTUBE ASSY (AW119 MKII AFT)
1	1	D119-796-241BND	CROSSTUBE, AFT
2	4	D2873-043	RADIUS BLOCK
3	1	D5122-1	CENTER SUPPORT
4	6	D5123-1	CLAMP CUSHION
5	2	D5123-5	CLAMP CUSHION
6	1	D5134-041	DAMPER SUPPORT ASSY, LH
7	1	D5134-042	DAMPER SUPPORT ASSY, RH
8	1	D5136-1	CONTACT PAD, LH
9	1	D5136-2	CONTACT PAD, RH
10	2	D5152-043	AFT POST MOUNT ASSY
11	2	D5515-1	GROUNDING CLAMP
12	16	CR3212-4-07	CSK RIVET, CHERRY MAX
13	6	MS21920-25	CLAMP
14	2	MS21920-28	CLAMP
15	2	MS27039-1-08	SCREW, PAN-HEAD
16	2	MS21042-3	NUT
17	4	NAS1149D0332J	WASHER



RELEASED
2017-05-04

APPROVED

DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	ML		
CHECKED	JMH	DRAWING NO.	REV. J
MFG. APPR.	DP	D119-796-241	SHEET 2 OF 7
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII AFT)	NTS
DATE	17.02.10	COPYRIGHT © 2014 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Entered: _____ Date: _____

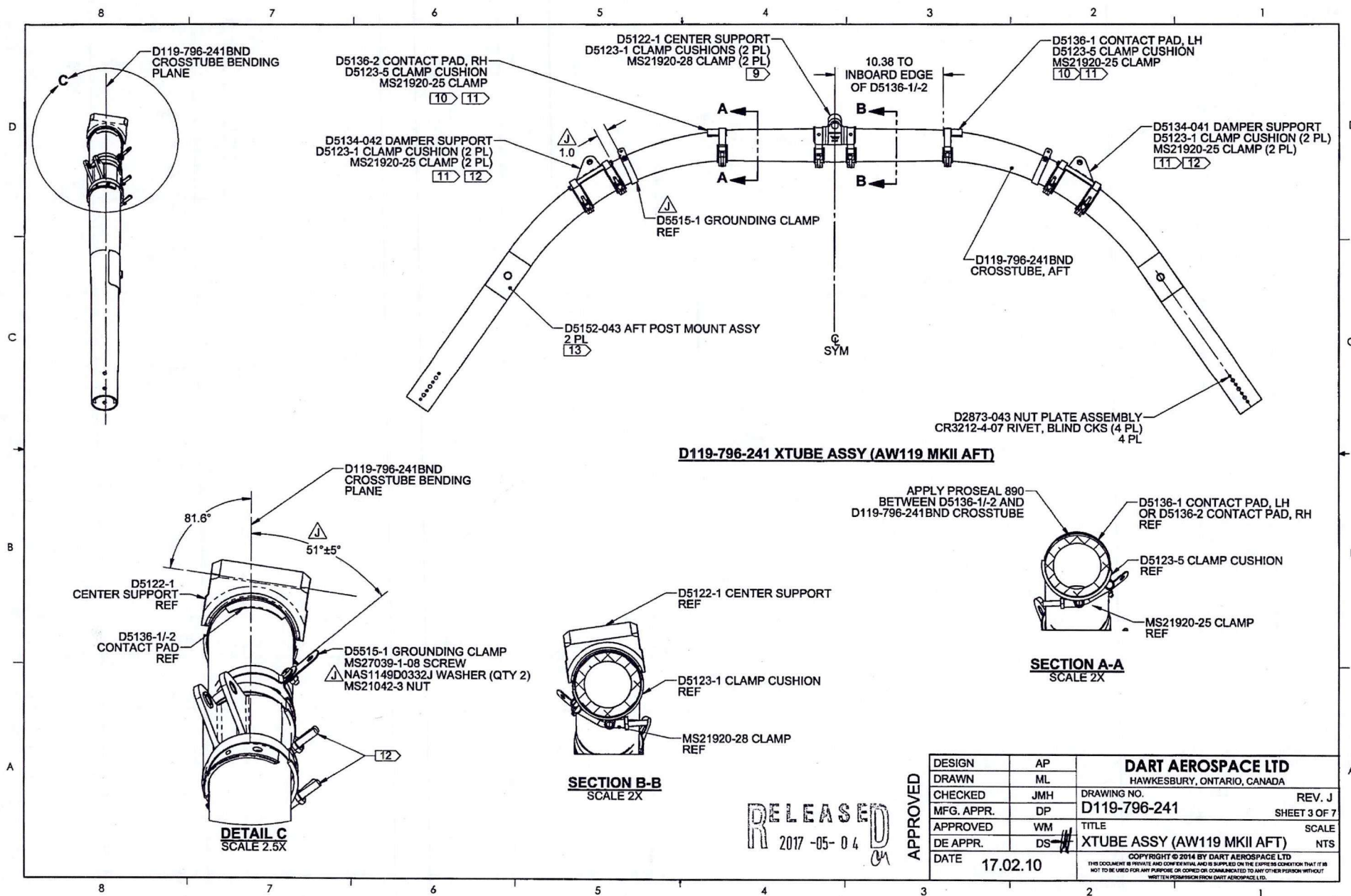


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS			
		Skid-tube ☐ Machining ☐ Large Fab ☐	Cross tube ☐ Small Fab ☐ Finishing ☐	Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐	Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐
Date :	Sequence #:	QTY Affected :			MRB (QSI042)
Description Work Order Deviation		Disposition			Completed By
					Lead hand / Supervisor
					QC / QA Coordinator
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY			
		☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled	☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function	☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up	☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread
		Other/Details:			



DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	ML		
CHECKED	JMH	DRAWING NO.	REV. J
MFG. APPR.	DP	D119-796-241	SHEET 3 OF 7
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII AFT)	NTS
DATE	17.02.10	COPYRIGHT © 2014 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMMERCE TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

Entered: _____ Date: _____

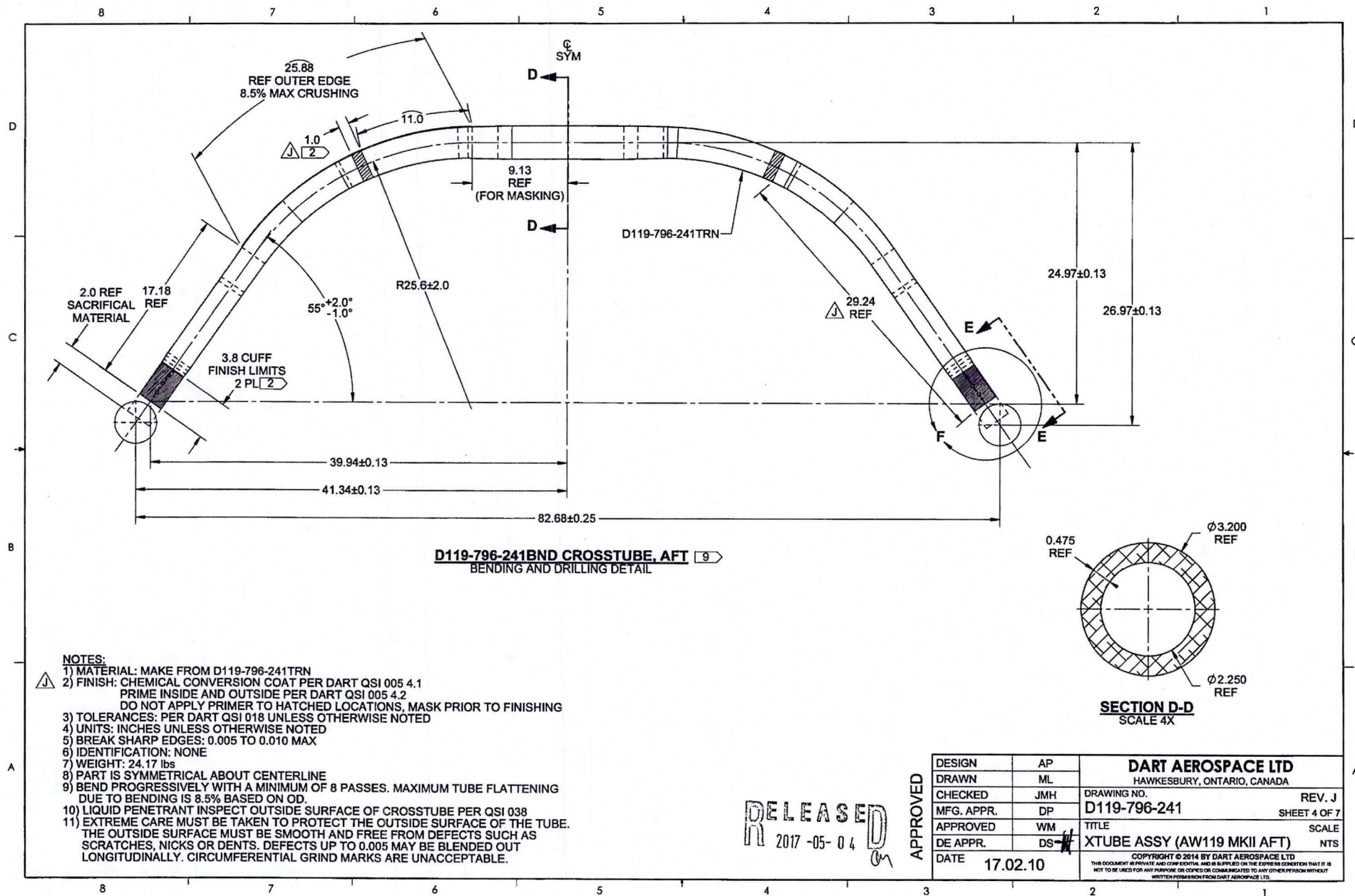


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042)	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐ ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled		FAULT CATEGORY ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					



Entered: _____ Date: _____

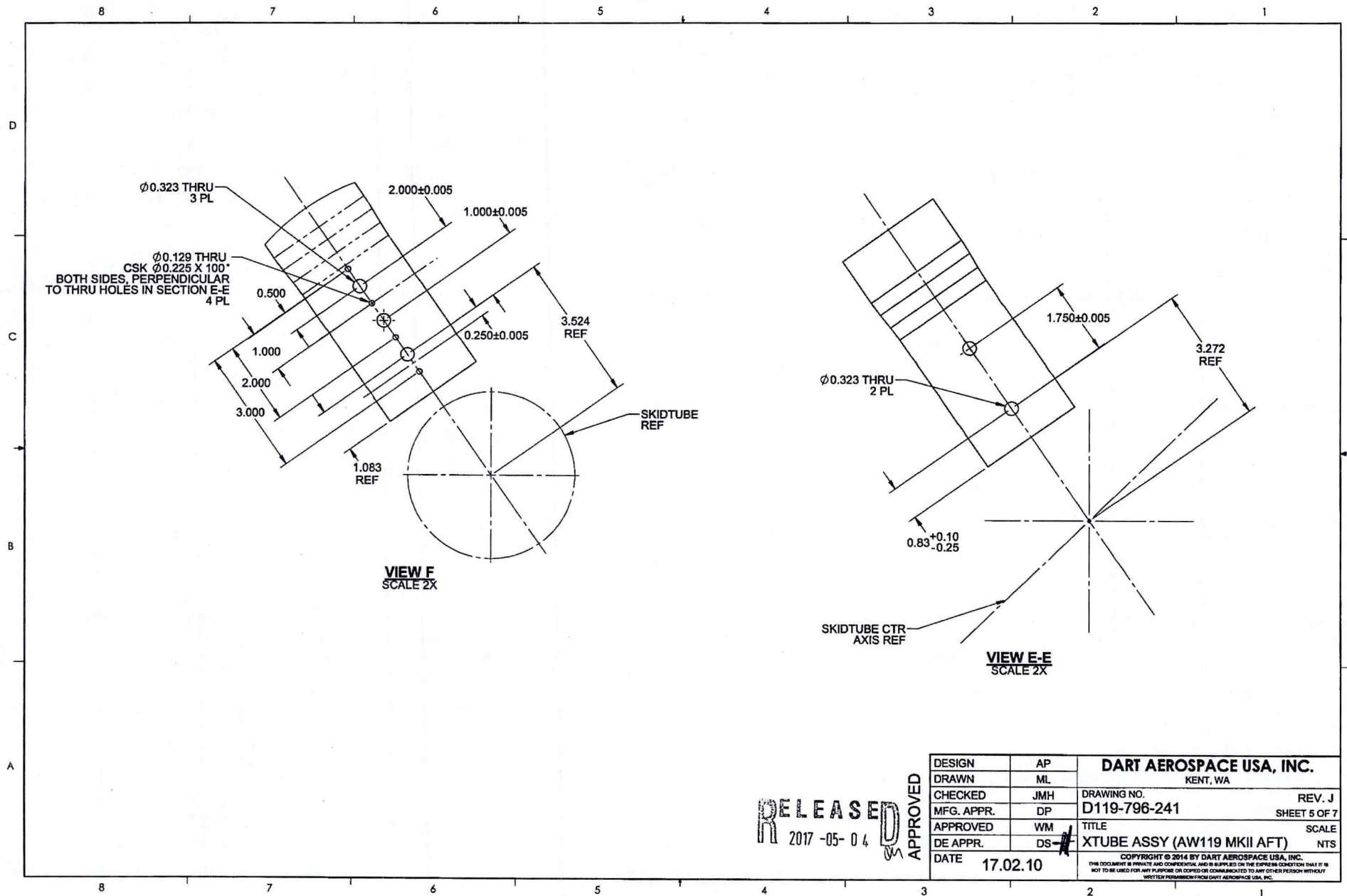


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
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				Lead hand / Supervisor	
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Other/Details: _____					



RELEASED
2017-05-04

APPROVED

DESIGN	AP	DART AEROSPACE USA, INC. KENT, WA	
DRAWN	ML		
CHECKED	JMH	DRAWING NO.	REV. J
MFG. APPR.	DP	D119-796-241	SHEET 5 OF 7
APPROVED	WM	TITLE	SCALE
DE APPR.	DS	XTUBE ASSY (AW119 MKII AFT)	NTS
DATE	17.02.10	COPYRIGHT © 2014 BY DART AEROSPACE USA, INC. THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC.	

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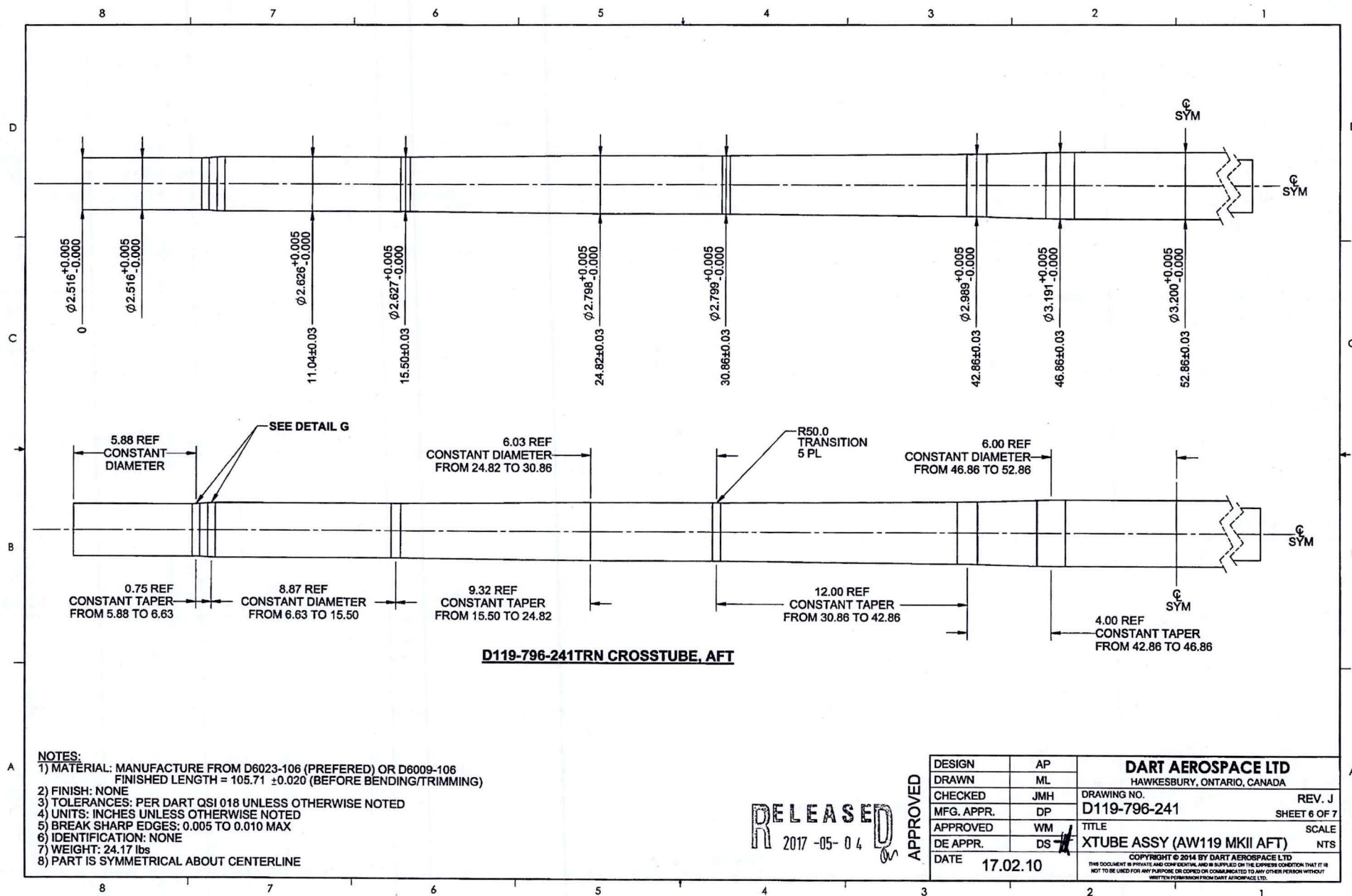


WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
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Description Work Order Deviation		Disposition		Completed By	
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Other/Details:					



Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
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Description Work Order Deviation		Disposition			
				Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause		FAULT CATEGORY			
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Other/Details: _____					

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

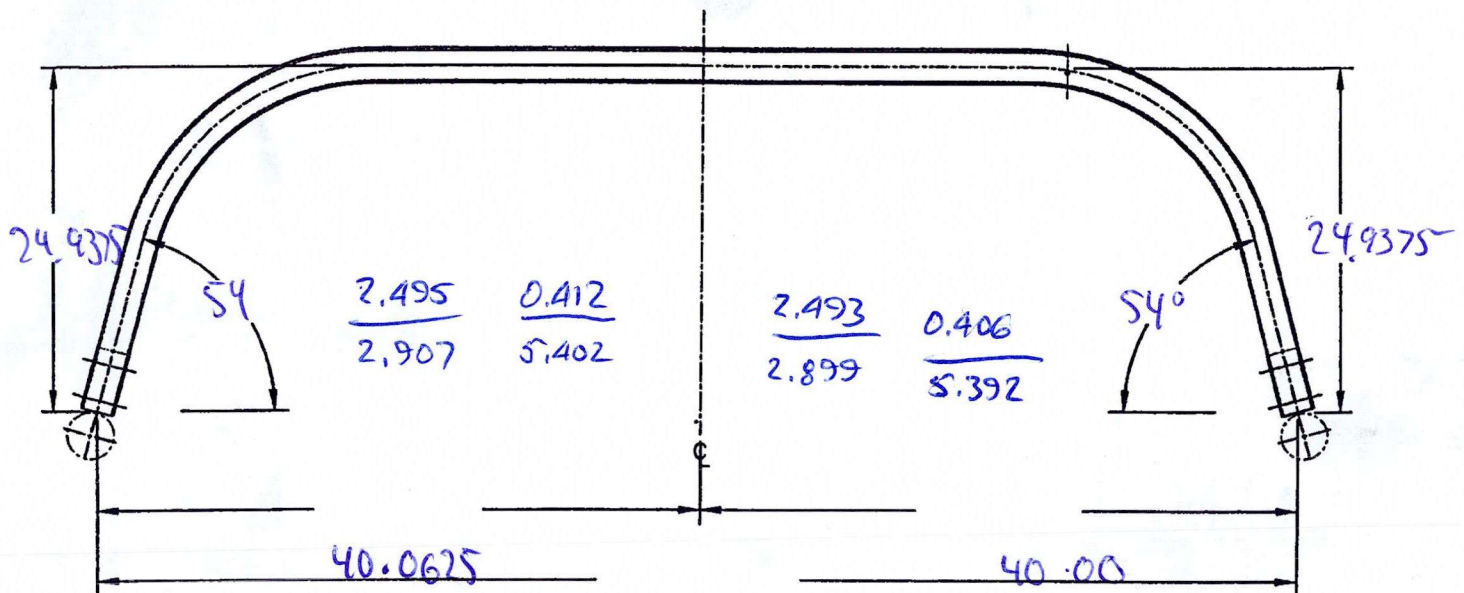
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Route update only ☐

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Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor	
				QC / QA Coordinator	
Root Cause Operator ☐ Manufacturing Process ☐ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		FAULT CATEGORY ☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☐ Finish ☐ Part Lost/Missing ☐ Misread			
Other/Details:					

DART AEROSPACE LTD	Work Order:	
Description: Crosstube Aft, with Step	Part Number:	D119-796-241
Inspection Dwg: D119-796-241	Rev: J	Page 1 of 1

Required Dimension	Min	Max
Height	24.840	25.100
1/2 Span	39.810	40.070
Angle	54°	57°
Total Span	79.620	80.140
Bending Passes	8	--
Crushing	--	8.5%



	Side A	Side B
Bending Passes	12	13
Crushing	7.6%	7.5%
Comments		

QC15 Inspection	PD
Date	19-02-22

Rev	Date	Change	Revised by	Approved
A	15.04.14	New Issue	KJ	
B	15.11.12	Min angle revised	KJ	
C	15.12.15	Dwg Rev updated	KJ	
D	17.07.12	Dwg Rev updated	KJ	

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐	DEPARTMENT/PROCESS <table style="width:100%;"><tr><td>Skid-tube ☐</td><td>Cross tube ☐</td><td>Eng. (Non-AW) ☐</td><td>Engineering ☐</td></tr><tr><td>Machining ☐</td><td>Small Fab ☐</td><td>Prod. Eng. Coord. ☐</td><td>Water Jet ☐</td></tr><tr><td>Large Fab ☐</td><td>Finishing ☐</td><td>Rec/Store/Packaging ☐</td><td>Supplier ☐</td></tr><tr><td></td><td></td><td></td><td>Quality ☐</td></tr></table>				Skid-tube ☐	Cross tube ☐	Eng. (Non-AW) ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Water Jet ☐	Large Fab ☐	Finishing ☐	Rec/Store/Packaging ☐	Supplier ☐				Quality ☐												
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Date : _____	Sequence #: _____	QTY Affected : _____		MRB (QSI042) _____																													
Description Work Order Deviation		Disposition		Completed By																													
Root Cause		FAULT CATEGORY																															
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Other/Details: _____																																	



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO042823**



Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO042823

PO Date: 3/7/19

Due Date: 3/12/19

Purchase Order
Revision:

Revision Date:

Ship-To Contact: Phone:

E-MAILED
MAR 13 2019

Via: Ground

Pymt Terms: Net 30

Freight Terms:

Special Comments:

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	187562	D119-796-141	Fwd Crosstube Installation Without Step (No Hardware) : TC STC SH14-45-Issue 1, FAA STC SR03504NY 15/01/28, EASA STC 10052022 Revision 1 15/02/13, DGCA INDIA LoA 07-09/2011-AED (Part) 15/07/16, BRAZIL STC 2015S07-16 15/07/30, CAAP PHILIPPINES LoA 16/05/11, CHINA VSTC0757 16/07/22, RUSSIA STC CT316-A119 16/08/11, DGAC INDONESIA STC SR025 18/02/19 Outsource2 (Outsource process - NDT per QSI038 4.1) *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 038Or Issue P/O: _____ LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
	187561			Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
Sub Total:							2	0	2		\$417.50



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER

PO042823



Items											
Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
2	187569	D119-796-241	Aft Crosstube Installation Without Step (No Hardware) : TC STC SH14-45-Issue 1, FAA STC SR03504NY 15/01/28, EASA STC 10052022 Revision 1 15/02/13, DGCA INDIA LoA 07-09/2011-AED (Part) 15/07/16, BRAZIL STC 2015S07-16 15/07/30, CAAP PHILIPPINES LoA 16/05/11, CHINA VSTC0757 16/07/22, RUSSIA STC CT316-A119 16/08/11, DGAC INDONESIA STC SR025 18/02/19 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***	Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
	187570			Firmed	-	3/12/19	1 pcs	0 pcs	1 pcs	\$208.75/pcs	\$208.75
Sub Total:							2	0	2		\$417.50

Grand Total: \$835.00

Order Notes

Procurement Quality Clauses

A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 3/13/19 8:19 AM dart.lavoie.chantal

**skyservice****Work Order Traveler**
Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO39578	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO42823
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:**CARRY OUT NDT INSPECTION (LIQUID PENETRANT) ON 4 CROSSTUBES**

ITEM ID: D119-796-241 AFT CROSSTUBE

1 - WORK ORDER ID#: 187570

2 - WORK ORDER ID#: 187569

DAS
68
9-89

ITEM ID: D119-796-141 FWD CROSSTUBE

3 - WORK ORDER ID#: 187561

4 - WORK ORDER ID#: 187562

Action Taken:						Date:	Initial/Stamp:
LIQUID PENETRANT INSPECTION CARRIED OUT ON ITEMS LISTED ABOVE (ITEMS 1-4) AS PER ASTM1417M-16						MAR 08 2019	DOT-APP 61 53-89
NO CRACK FOUND							
PEN ZL-37, MPO23206, CLEANER SKC-S MPO15030, EMU. MPO15896, DEV. MPO23451, UV LIGHT M-20142							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	DOT-APP 61 53-89	Date:
Name: ANTONINO MARGHETTA		MAR 08 2019